

Remarks

Claims 1-19, 21-23, and 33-52 are pending in the application.
Claims 1-17 are allowed. Claims 18, 19, 21-31, and 33-52 are rejected.

Claim Rejections under 35 USC §112

Independent claim 18 is rejected under 35 USC §112 as allegedly having limitations representing different embodiments of the invention and having limitations not supported by the specification and constituting new matter. Claims 19 and 21-35 are rejected by virtue of their dependency on claim 18. Independent claim 38 is rejected for the same reasons. Claims 39-41 are rejected by virtue of their dependency on claim 18. Applicants interpret the above to mean claims 19, 21-31, and 33-35 are rejected by virtue of their dependency on claim 18, independent claim 36 is rejected for the same reasons as applied to claim 18, and claims 37-52 are rejected by virtue of their dependency on claim 36. To overcome the rejections under 35 USC §112, Applicants hereby address independent claims 18 and 36.

Amended Claim 18

Independent claim 18 is amended to clarify that the second device comprises "a second communication interface capable of receiving said first output stream via a connection local to the first and second devices," to distinguish from other types of connections allowing connection to non-local devices, such as a connection to an external network. Support for the amendment is found in paragraphs [0044] and [0054], as part of the detailed description for a Virtual Device on Isolated PAN with Unique Open Device (title above paragraph [0054]). The connection local to the

first and second devices may be e.g. via a serial, parallel or USB interface (paragraph [0048]) or PAN or other local wireless connection (paragraphs [0034] and [0044]). This connection local to the first and second devices may be in common across various embodiments, and is thus applicable to independent claim 18, which is directed to a virtual device on a networked PAN as disclosed in paragraphs [0101]-[0103] (without open device) and paragraphs [0104]-[0117] (with open device).

Claim 18 is further amended to correct recitations of enumerated devices and limitations applied thereto. The Personal Area Network middleware is executed by at least a fourth device. The second device is arranged to intercept and redirect the first output stream to an input port of the third device based on redirection information stored in the user profile of the Personal Area Network middleware executing on the fourth device. The fourth device is in communication with the second device over a further network. Support for the amendment is found in Figs. 8 -10 and paragraphs [0102]-[0104].

For example, a computer on an external network and running PAN middleware can be the fourth device (paragraph [0102]). A mobile phone that can communicate with the computer running the PAN middleware (paragraph [0102]) can be the second device (Fig. 8 depicts the communication between the mobile phone and a computer on the Internet, the computer operating PAN middleware). The mobile phone can communicate over a PAN to a third device, which could be an earphone or a camcorder (Fig. 8 depicts the mobile phone, microphone, earphone and camcorder on a PAN). A first device, which could be a microphone or a camcorder (as shown in Fig. 8) can transmit a first output stream via a first communication interface and make a connection local to the first and second devices so that the second device can receive the first output stream at a second communication interface. Disclosure of the types of devices applicable as first or third devices in claim 18 is found in

paragraphs [0034]-[0048]. The mobile phone, as the second device, could communicate with and be directed by the computer operating PAN middleware as the fourth device, the communication being over the external network. The mobile phone, as the second device, could redirect a first output stream from a microphone or a camcorder as received over a connection local to the first and second devices, to a third device such as an earphone or a camcorder, communicating with the second device over the PAN.

In the above scenario, the camcorder could be either the first device or the third device, but not both at the same time. For example, the microphone could be the first device and provide an output stream over a wire, a USB cable or over the PAN to the mobile phone, as the second device, and the mobile phone could redirect the output stream over the PAN to the camcorder, as the third device. The connection between the first and second devices, in this example a wire, a USB cable or a PAN connection, is local to the first and second devices.

Claim 18 is still further amended to clarify that the second device is "connectable to a further network external to the Personal Area Network and external to the connection local to the first and second devices", that the fourth device is "in communication with the second device over the further network external to said first and third devices, and wherein redirection of said first output is performed via the fourth device communicating with the second device over the further network." Support for the amendment is found in Figs. 8 and 9 and paragraphs [0101]-[0106]. The mobile phone, as the second device, communicates with the fourth device such as the computer operating the PAN middleware, via the Internet. The Internet is an external network, or a further network external to the PAN. The Internet is external to the first and third devices, as the microphone, earphone and camcorder are not connected to the Internet. The Internet is external to the connection local to the first

and second devices, as the Internet is external to the connection between the first device such as the microphone or camcorder and the second device such as the mobile phone. The fourth device, operating the PAN middleware, communicates with the second device, such as the mobile phone over the further network. As a result, the second device intercepts and redirects the first output stream to the input port of the third device. The second device, such as a mobile phone, can form a PAN with a third device and can also communicate over an external network such as the Internet with a fourth device, such as a computer executing PAN middleware. Thus, the second device and at least the third device forming a Personal Area Network and the second device being connectable to and communicating over a further network external to the Personal Area Network, as recited in claim 18, is supported by the above-discussed drawings and paragraphs in the disclosure and does not constitute new matter.

Amended claim 18 clearly and consistently recites elements common across Figs. 8, 9, and 10. Amended claim 18 is fully supported by the indicated drawings and paragraphs and elsewhere in the description, and does not contain new matter. The clarifications and corrections in the supported amendment place claim 18 in allowable condition.

Since independent claim 18 complies with the written description requirement of 35 USC §112, claim 18 is allowable. As claims 19, 21-31, and 33-35 depend from and further limit allowable claim 18, claims 19, 21-31, and 33-35 are allowable.

Amended Claim 36

Independent claim 36 is amended to clarify that the second device comprises "a second communication interface capable of receiving said first output stream via a connection local to the first and second devices,"

to distinguish from other types of connections allowing connection to non-local devices, such as a connection to an external network. Support for the amendment is found in paragraphs [0044] and [0054], as part of the detailed description for a Virtual Device on Isolated PAN with Unique Open Device (title above paragraph [0054]). The connection local to the first and second devices may be e.g. via a serial, parallel or USB interface (paragraph [0048]) or PAN or other local wireless connection (paragraphs [0034] and [0044]). This connection local to the first and second devices may be in common across various embodiments, and is thus applicable to independent claim 36, which is directed to a virtual device on an isolated PAN as disclosed in paragraphs [0054]-[0084] (with unique open device) and paragraphs [0085]-[0100] (with multiple open devices).

As recited in independent claim 36, the Personal Area Network middleware is executed by a second device. The second device is arranged to intercept and redirect the first output stream to an input port of the third device based on redirection information stored in the user profile of the Personal Area Network middleware executing on the second device. Support for claim 36 is found in Figs. 2-7 and paragraphs [0026]-[0100].

For example, a PDA with a PAN can be the second device (paragraph [0054]). The PDA has and executes PAN middleware (paragraph [0059]). A microphone may be a first device, producing an output stream (paragraph [0064]). An earphone may be a third device, to which the sound output stream may be redirected (paragraph [0064]). The mobile phone can communicate over a PAN to a third device, which could be an earphone, a mobile phone or a camcorder (Fig. 3 depicts the PDA, microphone, earphone, mobile phone and camcorder on a PAN). The first device, which could be a microphone, a mobile phone or a camcorder (as shown in Fig. 3) can transmit a first output stream via a first communication interface and make a connection local to the first and second devices so that the second device can receive the first output

stream at a second communication interface. Disclosure of the types of devices applicable as first or third devices in claim 36 is found in paragraphs [0034]-[0048]. The PDA, as the second device, could execute the Personal Area Network middleware, store a user profile including redirection information for the third device, such as an earphone or a camcorder (as shown in Fig. 3), and form a Personal Area Network with the third device. The PDA, as the second device, could intercept and redirect the first output stream from the first device, such as the microphone, the mobile phone or the camcorder, to an input port of the third device, such as the earphone, the mobile phone or the camcorder, based on the redirection information stored in the user profile.

In the above scenario, each of the mobile phone or the camcorder could be either the first device or the third device, but not both at the same time. For example, the camcorder could be the first device and provide an output stream over a USB cable or over the PAN to the PDA, as the second device, and the PDA could redirect the output stream over the PAN to the mobile phone, as the third device. The connection between the first and second devices, in this example a USB cable or a PAN connection, is local to the first and second devices.

Claim 36 is further amended to recite the "second device being connectable to a further network external to the Personal Area Network and external to the connection local to the first and second devices". The second device executes the Personal Area Network middleware, storing a user profile including redirection information for the third device of the Personal Area Network, and "said user profile further comprises means for presenting which of said first, second and third devices are visible on the further network." Support for the amendment is found in paragraph [0069] and in claims 1 and 3 as originally filed. A PDA, as the second device, executes the PAN middleware and connects with first and third devices, such as a microphone, an earphone, a mobile phone or a

camcorder, over a PAN as shown in Fig. 3. The PAN middleware stores a user profile with redirection information. The PAN middleware further stores information on which of the first, second or third devices, which may be open, closed or primitive devices, should be visible on an external network, as in originally filed claims 1 and 3. Thus, the claimed limitations are supported in the above-discussed drawings and paragraphs in the disclosure and do not constitute new matter. Discussion of a further network external to the PAN and external to the connection local to the first and second devices, and other discussions made with regard to claim 18, apply herein as well.

Amended claim 36 clearly and consistently recites elements common across Figs. 2-7. Amended claim 36 is fully supported by the indicated drawings and paragraphs and elsewhere in the description, and does not contain new matter. The clarifications and corrections in the supported amendment place claim 36 in allowable condition.

Since independent claim 36 complies with the written description requirement of 35 USC §112, claim 36 is allowable. As claims 37-52 depend from and further limit allowable claim 36, claims 37-52 are allowable.

Claim Rejections under 35 USC §103

Claims 36, 37, and 42-52 are rejected under 35 USC §103(a) as being unpatentable over Fitton et al. (US 7,346,369) hereinafter Fitton, in view of Do et al. "The Device Management Service" hereinafter Do et al. and Haller et al. (US 7,039,033) hereinafter Haller. Applicants interpret the above to mean claims 36-52 are rejected under 35 USC §103(a), as claims 38-41 are directly or indirectly dependent from claim 36, along with claims 37 and 42-52.

Teachings in the References

Fitton teaches (in Fig. 1) a voice phone 100, a PDA 101 and a laptop 102 linked by a WPAN 108 (column 5, lines 55-61). Each of the devices 100, 101 and 102 has a radio network module 104 and a radio antenna 105, the radio network being external to the WPAN. In the example, the laptop 102 listens for paging messages for all devices within the distributed radio. An incoming paging request, received over the radio network, is passed to the phone 100 via the WPAN 108 (column 6, lines 1-12). The phone 100 accepts the paging request, synchronizes to the radio network and enters connected mode, communicating over the radio network (column 6, line 15).

Do et al., in "The Device Management Service", teaches a Virtual Terminal which is used for accessing communication services or computing services in connection with a service provider. The services can be a basic telephone call (page 200, first paragraph) or other voice communication or telephony (page 204, fourth paragraph), WAP/WEB services which are actually computing services (ibid.), or voice, video or data streams from a service provider (Fig. 12 and page 206, first and second paragraphs). In all examples in the reference, an output stream originates from a service outside of the Virtual Terminal, and is routed to a device within the Virtual Terminal, or an input stream originates from a device within the Virtual Terminal and is sent to a service provider, the service provider operating on a network external to the connections among the devices in the Virtual Terminal. The service provider may operate on an IP-based network (shown in Figs. 6-8, 14, 15, and 20) or a telecom network (shown in Figs. 11, 18, and 19).

Haller teaches servers 101 and 102 provide information such as webpages or application software components to terminals 107 by way of a gateway device 106 (Fig. 1 and page 4, lines 50-60). The servers 101 and 102 communicate over a cellular network 105 to the gateway device 106,

and the gateway device 106 communicates to terminals 107 using a PAN such as Bluetooth (page 4, lines 14-27).

Claim Limitations Not Taught in the References

All three references Fitton, Do et al. and Haller have in common that a service from a provider on a large external network such as an IP network, a telecom network or a radio network, is routed through a go-between device communicating with both the large external network and a smaller personal or local network such as a PAN, which device then routes the service to one of several devices within a smaller personal or local network. In all three references, an output stream e.g. from a service provider travels over the external network to the go-between device, and the go-between device routes the output stream to a selected device within the local network. In all three references, an input stream e.g. from a selected device within the local network, goes to the go-between device and travels over the external network to the service provider.

The references are silent as to a first output stream received from a first device to a second device via a connection local to the first and second devices, intercepted by the second device and redirected to an input port of a third device communicating with the second device over a PAN as in claim 36. The references teach routing an output stream from the outside of a group of devices to one of the devices in the group, and do not teach routing an output stream from inside a group of devices to one of the devices of the group.

Specifically, Fitton does not teach rerouting of a voice stream from any of the voice phone 100, the PDA 101 or the laptop 102 as received by a second of the devices 100, 101 or 102 and rerouted to a third of the devices 100, 101 or 102. The voice stream from any of the voice phone 100, the PDA 101 or the laptop 102 goes out over the respective radio network

module 104 and radio antenna 105 of that particular radio device, and is not rerouted within the trio of devices 100, 101 or 102. Further, the paging request, which is routed from laptop 102 to voice phone 100, does not originate from any of the devices 100, 101 or 102, nor is the paging request originally communicated to the laptop 102 by a connection local to two of the devices 100, 101 or 102.

Do et al. does not teach rerouting of an output stream from one of the devices 1-4 to another one of the devices 1-4. Any output stream from a device 1-4 is routed through the virtual terminal and to a service provider on an external network, and any output stream from a service provider on an external network is routed through the virtual terminal to a device 1-4. Fig. 12 shows a merging of streams and delivering all of the streams as a merged stream to a service, but does not show rerouting of a stream within local devices. Fig. 13 shows separate streams going to a service or from a service on an Internet connection, but does not show rerouting of a stream within local devices. These concepts apply to Figs. 18 and 19 as well. Any output stream from a service provider on an external network is not connected to one of the devices 1-4 via a connection local to two of the devices 1-4. Any output stream from one of the devices 1-4 is not rerouted by a further of the devices 1-4 to a still further one of the devices 1-4.

Haller does not teach rerouting of a voice stream from a terminal 107 to another of the terminals 107. Any output stream from a terminal 107 is routed through the gateway device 106 to a server 101 or 102 via the cellular network 105. Any output stream from a server 101 or 102 is sent over the cellular network 105 and routed from the gateway device 106 to one of the terminals 107, and such output stream does not originate from one of the terminals 107. Any output stream from a server 101 or 102 is not connected to the gateway device 106 via a connection local to a terminal 107 and the gateway device 106.

No Teaching, Suggestion or Motivation within the References

There is no teaching, suggestion or motivation within the references to modify any of the respective systems or combine systems to produce the limitations of claim 36. Fitton does not reroute the voice communications among the voice phone, PDA and laptop in the manner of claim 36, as that would defeat the purpose of establishing a call between one of the voice phone, the PDA or the laptop and another user over the GSM network, using the antenna 105 of the particular device 100, 101, or 102. Do et al. does not reroute an output stream from one of devices 1-4 to another of devices 1-4 as such would not achieve a meaningful network connection to a service from a service provider on an IP network or a telecom network. Haller does not reroute an output stream from one of terminals 107 to another of terminals 107 as such would not achieve a meaningful network connection to server 101 or 102.

A motivation for the claimed invention is found in the detailed description of the invention. "However, most importantly, connectivity does not necessarily mean communication and many challenging issues must be resolved before devices can collaborate and together form a Virtual Device. This invention proposes and describes a PAN middleware that enables the formation of a Virtual Device on the PAN and that is capable of handling the dynamic presence of devices and the diversity of device types" (page 2, paragraph [0026]).

Such motivation is not found in Fitton, as the reference is directed to sending or receiving network information of a first network over a second network (page 2, lines 52-61), the network information originating on a network external to the connections among the devices 100-102.

Such motivation is not found in Do et al., as the reference is directed to a Virtual Terminal receiving or sending voice, video or data streams from or to a service provider. An output stream either originates

in a service provider outside of the devices 1-4 or is sent to a service provider outside of the devices 1-4.

Such motivation is not found in Haller, as the reference is directed to terminals on a PAN receiving information from servers outside of the PAN.

For these reasons, amended claim 36 is unobvious over the references and is allowable. Since claims 37-52 depend from and further limit allowable claim 36, claims 37-52 are allowable. These reasons apply further to amended claim 18, which is related to claim 36 and has additional limitations, and is thus unobvious over the references and allowable. Since claims 19, 21-31, and 33-35 depend from and further limit allowable claim 18, claims 19, 21-31, and 33-35 are allowable.

Conclusion

Applicants thank the Examiner for the allowance of claims 1-17 and request Reconsideration for the remaining claims and a Notice of Allowance.

The Examiner is invited to contact the undersigned with any comments or questions at 408-297-9733 between 9:00 AM and 5:00 PM PST.

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CERTIFICATE OF TRANSMISSION

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) on the date shown below.

Signed: *Sally Azevedo*
Typed Name: Sally Azevedo

Date: March 22, 2010

Respectfully submitted,

Thomas Schneck

Thomas Schneck

Reg. No. 24,518

Schneck & Schneck

P.O. Box 2-E

San Jose, CA 95109-0005

(408) 297-9733